

REMARKS/ARGUMENTS

The sequence listing has been amended to add sequences for SEQ ID NO's: 62-65 for the purposes of clarity.

SEQ ID NO's: 62-65 combine the sequence disclosed within the specification as originally filed for *Trichoderma resei* xylanase II, (SEQ ID NO's: 16 and 53, and Figure 1, Tr2), along with specific regions that are mutated as described within the specification as follows:

SEQ ID NO:62 - TrX-162H-DS1; Table 2, Example 1C, SEQ ID NO's: 26, 27;

SEQ ID NO:63 - TrX-162H-DS2; Table 2, Example 1D, SEQ ID NO's: 21-23, 45-48;

SEQ ID NO:64 - TrX-162H-DS4; Table 2, Example 1E, SEQ ID NO's:21-23, 49-52; and

SEQ ID NO:65 - TrX-DS8; Table 2, Example 1F.

Figure 1, has been amended so that the SEQ ID NO's have been added to the last page of the Figure. Furthermore, the definitions of the abbreviations used within Figure 1 have been removed. Support for the addition of SEQ ID NO's to Figure 1 may be found in Table 1 of the present specification.

Paragraphs beginning on page 24, line 1; page 25, line 37; page 26, line 14; and page 28, line 3 have been amended to correct minor typographical errors and to explicitly state the SEQ ID NO: for sequences following the aforementioned paragraphs.

Claims 1 and 18-22 remain in this application. Claims 2-17 and 29-32 have been cancelled without prejudice or disclaimer. Claims 23-28 have been withdrawn as the result of an earlier restriction requirement.

A diskette containing the amended Sequence Listing for this application in computer readable form (CRF) and a paper copy of the substitute Sequence Listing in compliance with 37 C.F.R. § 1.821-1.825 are enclosed. Applicants hereby certify that the information in the computer readable form on the diskette and in the hard copy of the Sequence Listing is the same and includes no new matter. The enclosed computer readable copy and paper copy of the Sequence Listing are believed to bring the Sequence Listing into full compliance with the sequence rules.

Objection under 35 U.S.C. 112

Claims 1, 2, 29 and 3-22 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As the Examiner suggested, applicants have amended claim 1 to remove the term “characterized”. Claims 2 and 29 have been cancelled without prejudice or disclaimer, therefore the rejection against these claims is moot. Removal of the rejection under 35 U.S.C. 112 against claims 1, 2, 29, and 3-22 is requested.

Examiner has rejected claims 12-22, 30 and 31 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 12-17 and 30-31 have been cancelled without prejudice or disclaimer. Therefore, the rejection against these claims is moot. Applicant also notes that claims 18-22 do not recite the phrase “its equivalent”, nor do they depend from claim 12. Removal of the rejection under 35 U.S.C. 112, second paragraph against claims 12-22, 30 and 31 is respectfully requested.

Claims 18-22 are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner urged applicants to provide an amino acid SEQ ID NO in order for the Examiner to conduct a proper search. Applicant has amended claims 18-22 to recite SEQ ID NO's of the claimed modified xylanases. Removal of the rejection under 35 USC 122 against claims 18-22 is respectfully requested.

Claims 1-10, 12-17 and 29-31 are rejected under 35 U.S.C. 112, first paragraph. The Examiner alleges that the specification does not reasonably provide enablement for any modified xylanase from any source having any structure and having increased or improved thermostability or its equivalents. Claims 2-17 and 29-32 are cancelled without prejudice or disclaimer, therefore the rejection against these claim is moot.

Applicant has amended Claim 1 to recite a modified Family 11 xylanase that comprises a substitution at position 162 (determined from sequence alignment of said modified xylanase with *Trichoderma reesei* xylanase II amino acid sequence) and at least one intramolecular disulfide bond. The modified xylanase is further characterized as exhibiting at least 40% of optimal activity from about pH 3.5 to about pH 6.0, and from about 40 to about 60°C, and as being thermostable. Applicant submits that the sequence comparisons of members of the Family 11 xylanases as provided in Table 1, page 13, and Figure 1, in combination with exemplified *Trichoderma* mutants defined in Table 2, page 19 (and Example 2) of the specification provides one of skill in the art sufficient information to prepare analogous mutations within the Family 11 xylanases. One of ordinary skill in the art would be able to use the information disclosed within the specification and

prepare analogous mutants in other Family 11 xylanases without undue experimentation. Applicant submits that the amended claims, when read in light of the disclosure provide sufficient support and guidance that a person of skill in the art would be enabled to make the present invention without undue experimentation. Removal of the rejection under 35 USC 122 against claims 1-10, 12-17 and 29-31 is respectfully requested.

Claims 1-22 and 29-32 are rejected under 35 U.S.C. 112, first paragraph, on the grounds that the variants defined in the claims are not disclosed in the specification. Applicant notes that claim 1 has been amended (as discussed above), such that it is directed to modified Family 11 xylanases having at least one disulfide bond and a basic amino acid residue at position 162, as well as exhibiting particular characteristics. Furthermore, Applicant submits that amended claims 18-22 recite a SEQ ID NO: for each of the variants defined in these claims. These variants are fully described throughout the specification, and in the Examples. Claims 2-17 and 29-32 are cancelled without prejudice or disclaimer, therefore the rejection against these claim is moot. Removal of the rejection under 35 USC 122 against claims 1-22 and 29-32 is therefore respectfully requested.

Objection under 35 U.S.C. 102

Examiner has rejected claims 1-10, 15-16, and 29-32 under 35 USC 102(b) as being anticipated by Wakarchuk et al. Applicant respectfully disagrees with the Examiner's rejection for the following reasons.

As noted above, claim 1 is directed to a modified Family 11 xylanase comprising a substitution at position 162 (determined from sequence alignment of said modified xylanase with

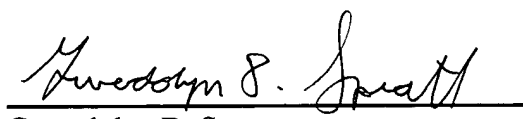
Trichoderma reesei xylanase II amino acid sequence) and at least one intramolecular disulfide bond. The modified xylanase is further characterized as exhibiting at least 40% of optimal activity from about pH 3.5 to about pH 6.0, and from about 40 to about 60°C, and as being thermostable.

Applicant submits that Wakarchuk teaches increased thermostability using disulfide bridges but does not disclose a modified xylanase comprising at least one disulfide bond and a mutation at position 162, as presently recited in claim 1. Therefore, the cited reference does not anticipate the claimed subject matter. Claims 2-10, 15, 16 and 29-32 are cancelled without prejudice or disclaimer, therefore the rejection against these claims is moot.

In light of the above comments and amendments, Applicant respectfully requests the withdrawal the rejection under 35 USC 122 against claims 1-10, 15, 16 and 29-32.

It is respectfully submitted that the above-identified application is now in a condition for allowance and favourable reconsideration and prompt allowance of these claims are respectfully requested. Should the Examiner believe that anything further is desirable in order to place the application in better condition for allowance, the Examiner is invited to contact the applicant's undersigned attorney at the telephone number listed below.

It is believed that no fees are due at this time. However, the Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to Deposit Account No. 14-0629.


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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:
Commissioner for Patents, P.O. Box 1450 Alexandria, Virginia 22313-1450 on the date shown below.



Gwendolyn D. Spratt

10-27-03

Date